

DISEASES

OF THE

CHEST

Official Organ of the Amer. College of Chest Physicians
Editorial & Business offices Physicians Postgraduate Press.
500 North Dearborn Street, Chicago, Illinois.

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MEMBER: ASSOCIATED EDITORS OF TUBERCULOSIS PUBLICATIONS



(A MONTHLY PUBLICATION)

Subscription: United States \$2.50
per year. Other countries
\$3.00 per year.

Entered as second-class matter
August 18, 1936, at the post office
at El Paso, Texas, under the Act
of August 24, 1912.

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Created by the House of Delegates

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M-6.17

February 23, 1942

Mr. Murray Kornfeld
The American College
of Chest Physicians
500 North Dearborn Street
Chicago, Illinois

Dear Mr. Kornfeld:

I wish to express to you on behalf of the Committee on Medical Preparedness and the staff at these headquarters our genuine appreciation of the work which you and the governors of your organization have done in providing us with special information relative to the qualifications of physicians who claim to be devoting either full time or part time in the practice of Tuberculosis specialty.

The information will be very useful in connection with the requests that are received from the various governmental agencies in addition to the Army and Navy.

Please transmit to your associates our thanks for this very helpful assistance.

Sincerely yours,

R. G. Leland

R. G. Leland, M. D.
COMMITTEE ON MEDICAL
PREPAREDNESS

RGL:EH

Extrapulmonary Non-Tuberculous Disease Complicating Pulmonary Tuberculosis

EUGENE ROSENMAN, M.D., F.A.C.C.P.*

Duarte, California

That non-tuberculous extrapulmonary disease can occur in a patient having pulmonary tuberculosis is self-evident. Yet, it appears that this possibility is quite often ignored in the differential diagnosis of extrapulmonary complications of pulmonary tuberculosis. The mere fact that a patient has pulmonary tuberculosis seems to be a sufficient excuse to label any extrapulmonary complication as tuberculous. Too often hasty erroneous diagnoses of intestinal tuberculosis or tuberculous laryngitis are made merely because the patient happens to suffer also from pulmonary tuberculosis. It is not intended here to minimize the importance of considering extrapulmonary tuberculous complication in the differential diagnosis of such cases. The writer merely wishes to stress the importance of considering also the possibility of non-tuberculous disease occurring in such patients. This possibility should be kept in mind even in cases of moderately or far-advanced pulmonary tuberculosis in which tuberculous extrapulmonary complications are more likely to occur. In minimal pulmonary tuberculosis, and especially in arrested cases, such secondary extrapulmonary tuberculous complications are very rare indeed; and in such cases non-tuberculous disease should be ruled out first in the differential diagnosis. Three such cases simulating tuberculous enteritis are presented here as a demonstration of the pitfalls in diagnosis one may encounter if this fact is not kept in mind.

Case 1—K. R., female, age 40. Admitted to the Los Angeles Sanatorium, Sept. 25, 1935, complaining of diarrhea, vomiting and loss of 35 pounds weight over a period of two years. Prior to admission, she was studied in another hospital where a roentgenogram of the chest revealed a "healed tuberculous lesion in the left upper lobe," and an exploratory laparotomy revealed, according to the surgeon's report, "tubercular enteritis involving especially the lower ileum." On ad-

mission, patient appeared markedly emaciated (weight was 89 pounds). Physical examination revealed nothing remarkable. Roentgenogram of the chest revealed several small nodules in the third anterior interspace in the left side, apparently healed tuberculosis. No sputum was available, since patient did not cough or expectorate. Examination of feces for tubercle bacilli was negative. Gastric analysis revealed total and free acid within normal limits. Hemogram was normal, except for a mild microcytic anemia and an erythrocyte sedimentation rate of 41 mm. in one hour. Series roentgenograms with barium progress meal revealed a spasm of the terminal ileum. A clinical diagnosis of non-specific ileitis was made, and an exploratory laparotomy was performed. This revealed a thickening of the terminal ileum over a distance of two feet, and a proximal dilatation of the small bowel indicating a partial obstruction. No nodules were found on the peritoneal surfaces. The terminal ileum was resected and microscopic examination revealed subacute regional ileitis of unknown non-specific origin. No evidence of tuberculosis was found. Patient made an uneventful recovery. When last seen in 1939, she was well and working.

Comment—The roentgenologic picture in this case was suggestive of intestinal tuberculosis, viz., a defect in filling of the terminal ileum with retardation of passage of the barium meal proximal to the lesion. This picture and the gross pathologic findings on laparotomy, as reported by the surgeon, could have led us to acquiesce in the original diagnosis of intestinal tuberculosis, were it not for the fact that the pulmonary lesion was minimal and apparently healed. The similarity in the roentgenologic appearance of intestinal tuberculosis and non-specific ileitis of Crohn is well known. Weber¹ has pointed out the difficulty in differentiating between these diseases roentgenologically. After discussing some fine technical points as guides in the differential diagnosis, he finally resorts to the importance of ascertaining the

* Los Angeles Sanatorium.

presence or absence of active pulmonary tuberculosis as an important aid. Even the gross pathologic appearance of these two lesions is indistinguishable. Only the microscopic picture can be of help in ascertaining definitely which of these two conditions one is dealing with, and even this fails at times, as was noted by Schapiro.² It appears, therefore, that clinically, before laparotomy is done, the presence or absence of active pulmonary tuberculosis is the most important aid in the differential diagnosis between intestinal tuberculosis and non-specific ileitis of Crohn.

Case 2—J. S., male, age 44. Transferred to Los Angeles Sanatorium March 30, 1935, from another hospital with a diagnosis of tuberculosis of the cecum. He had been complaining of severe generalized cramp-like abdominal pains, unrelated to time or kind of food intake, since March 1934. Pain was associated with anorexia, loss of twenty pounds of weight in six months, and chills and fever of 102 degrees F. On admission, patient was

acutely ill and appeared cachectic. His weight was one hundred pounds. The abdomen was distended but soft, and no masses were palpable. There were no other abnormal findings on physical examination. Chest roentgenogram revealed several calcified nodules in the apices of both lungs. Hemogram showed hemoglobin 56 per cent, erythrocytes three million, leukocytes and differential were normal, erythrocyte sedimentation rate was 19 mm. in one hour. Sputum was negative for tubercle bacilli and occult blood. Widal reaction was negative. Series roentgenograms of the gastrointestinal tract with a barium meal revealed evidence of some obstruction in the cecal region. After a short stormy course of chills and fever of 102 degrees F., rapid loss of weight and recurring attacks of diarrhea, patient expired April 24, 1935. Post mortem examination revealed healed tuberculosis of the apex of the right lung; primary scirrhus carcinoma simplex of the head of the pancreas with metastases into the retroperitoneal lymph glands and the

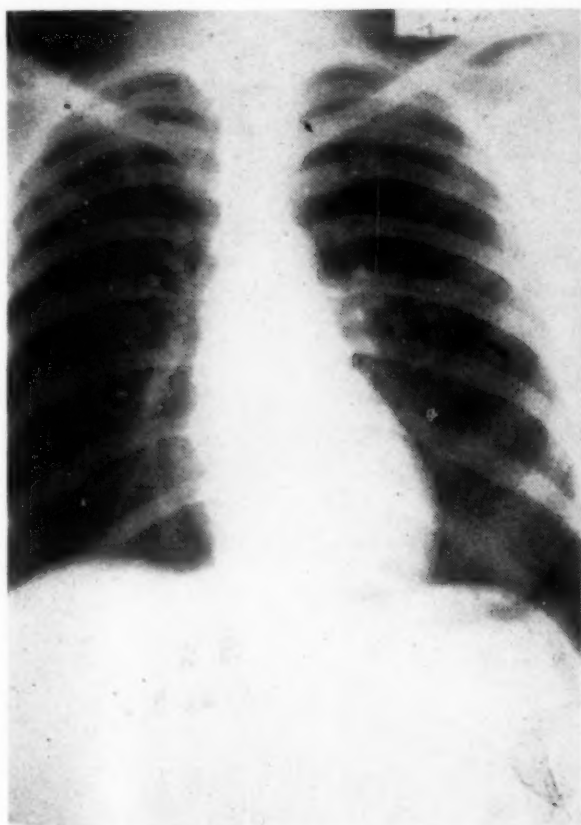


Figure I.

Case 1—Note few discrete healed nodules in the 3rd anterior interspace.



Figure II.

Case 2—Film taken 6 hours after ingestion of barium. Note the filling defect of the terminal ileum—string of Crohn.

spleen; and few annular ulcerations in the lower duodenum and upper jejunum, probably from tumor infarction. No lesions were noted in the colon, cecum or lower ileum.

Comment—The presence of calcified nodules in the apices of the lungs as demonstrated on the roentgen film apparently prejudiced the mind of the physician to make the erroneous diagnosis of tuberculosis of the cecum. Certainly, the mere finding of obstruction in the cecum is insufficient evidence for such diagnosis. A filling defect in the cecum may be encountered in any ulcerative lesion and is a common sign in carcinoma of the cecum. In this particular case carcinoma of the cecum could have been considered a more likely possibility and a more nearly correct diagnosis, since the patient did have a malignancy in the abdomen. The true localization of the malignancy in this case was difficult indeed, since the patient had no jaundice and no pain or tenderness in the upper abdominal quadrant.

Case 3—S. R., age 53. Has had pulmonary

tuberculosis since 1929. He was a patient in the Los Angeles Sanatorium during the year of 1930. At that time a fibrocaceous involvement of the major portion of the right lung was found. Sputum was positive for tubercle bacilli. After the induction of therapeutic pneumothorax there was a marked improvement in the roentgenologic appearance of the chest and a conversion of the sputum. Patient was discharged as an arrested case, and in 1932 after the pneumothorax was discontinued on the outside, there was at re-examination evidence of a marked fibrosis of the major portion of the right lung. There were no changes noted on a recheck film taken in 1934. During all these years and until 1940 patient was well and active. During 1940 he noticed a gradual loss of weight which became more rapid in the last two months prior to his readmission to the Los Angeles Sanatorium. During those two months, he noticed also some increase in cough and a slight dyspnea on exertion. But his chief complaint was a severe diarrhea

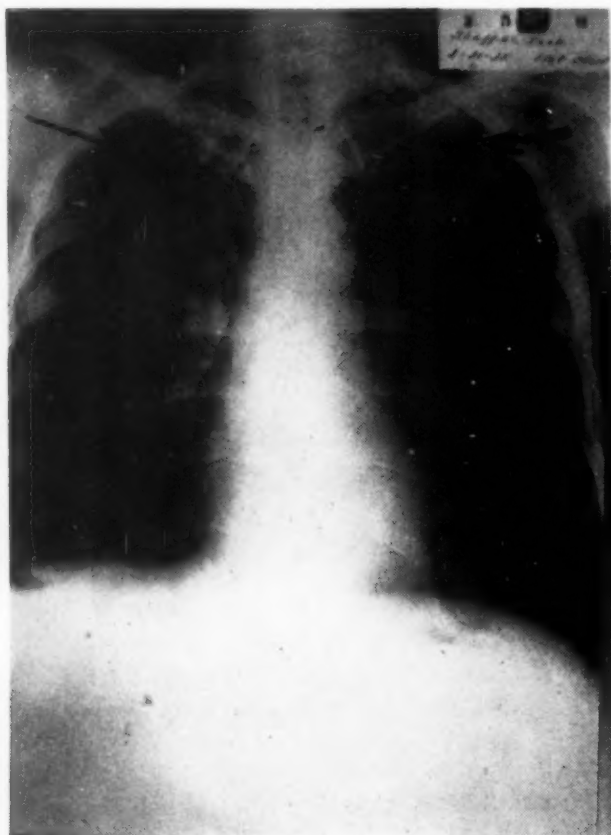


Figure III.

Case 2—Note few calcified nodules in apices of both lungs, especially the right apex.



Figure IV.

Case 2—Film taken 6 hours after ingestion of barium meal. Note filling defect in cecum and ascending colon.

of twelve bowel movements daily associated with mild abdominal postprandial cramps and a tenesmus. He also noticed blood in his stools on a few occasions. His examining physician recommended sanatorium care and he was, therefore, admitted to this institution November 18, 1940. On admission, he was found to be undernourished, but not acutely ill. His weight was 122 pounds. Roentgenogram of the chest revealed no change from his previous films, i.e., there was marked fibrosis throughout the right lung. Activity of the lesion was questionable. Sputum was negative for tubercle bacilli. Other laboratory findings of note were: hemoglobin 70 per cent, erythrocytes 4,250,000, leukocytes and differential within normal limits. Examination of stool for occult blood was positive. Series roentgenograms of the gastrointestinal tract with a barium meal did not reveal anything remarkable. A sigmoidoscopic examination revealed a growth in the rectum about 7 inches from the anus. Biopsy was performed and a grade II adenocarcinoma was found on microscopic examination.

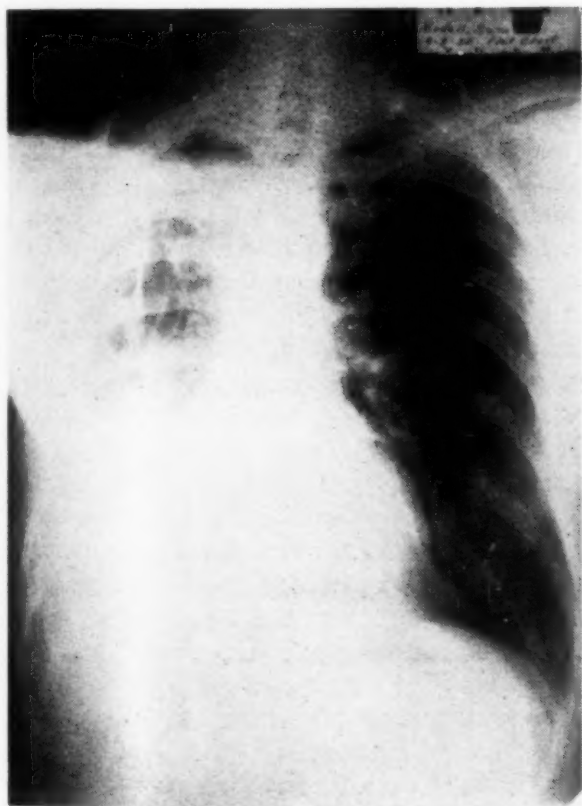


Figure V.
Case 3—Note marked fibrosis throughout right lung. Activity cannot be determined from film.

Comment—In this case a consideration of intestinal tuberculosis was more justifiable in view of the fact that the patient's pulmonary lesion was far advanced. However, according to the findings of Erickson,³ intestinal tuberculosis is uncommon after 4 years of pulmonary tuberculosis, 90 per cent of the cases of intestinal tuberculosis developing within 4 years of pulmonary tuberculosis. These findings, coupled with the fact that this patient's sputum has been negative for tubercle bacilli over a period of eight years, should have made one keep the diagnosis of intestinal tuberculosis in abeyance and look for some other more likely cause for the patient's symptoms.

Discussion—Extrapulmonary tuberculosis not secondary to a pulmonary focus of infection is very rare, the only exception being bone and joint tuberculosis which often may be unassociated with any pulmonary focus, especially in case of the bovine bacillus infection. All other extrapulmonary tuberculous infections are usually secondary to a focus in the lungs which may be latent or active. This pulmonary focus may be either the primary phase ("childhood type" or primary complex of Ranke) or the secondary reinfection phase ("adult type"). In case of the former, the implantation into the extrapulmonary organs has taken place during the early generalization phase of Ranke; in the case of the latter, during the later generalization phase, or by direct contact with the infected sputum. In the former case, the primary focus may be healed, while the extrapulmonary disease may become active and present the only manifestation of clinical tuberculosis in the body. This does occur in some cases of genito-urinary tuberculosis, also in some of the human bacillus type of bone tuberculosis. The great majority of the other extrapulmonary tuberculous infections, however, as well as a large percentage of genito-urinary and bone tuberculosis, are associated with an active pulmonary lesion of the secondary phase, the implantation of the tuberculosis having taken place either by direct contact with infected sputum or by the hematogenous or lymphogenous route. Those taking place by the hematogenous route are usually associated with a generalized activity and spread of the tuberculosis, and do not present any diagnostic

difficulties. It is the more insidious infections occurring by the direct contact with the infected sputum, e.g., tuberculous laryngitis, tuberculous enteritis, tuberculous peritonitis (the latter is usually secondary to intestinal tuberculosis), that often present difficult problems in diagnosis. Of these, the most common and most difficult problem is presented by intestinal tuberculosis for several reasons: first, there are a great many diseases both inside and outside of the abdominal cavity that may give rise to intestinal symptoms; second, intestinal symptoms are quite common in patients with pulmonary tuberculosis, these symptoms being of a toxic or a neurogenic origin; third, intestinal tuberculosis is the most common extrapulmonary tuberculous complication. It is, therefore, only natural that the physician should first think of intestinal tuberculosis whenever a patient with pulmonary tuberculosis begins complaining of intestinal symptoms. However, there are certain facts related to the pathogenesis and etiology of intestinal tuberculosis (as well as of many other extrapulmonary tuberculous complications), which could be of great aid in their differential diagnosis. It is a well established fact that chronic ulcerative intestinal tuberculosis is caused by direct infection of the intestinal mucosa by tubercle bacilli contained in the ingested sputum. Whatever the predisposing factor for the pathogenesis of intestinal tuberculosis may be, whether it be a preexisting inflammatory change in the intestinal wall, or a deficiency of certain vitamins in the diet, or trophic disturbances,⁴ or certain allergic or anergic states, there must be a direct infection of the intestinal mucosa with sputum containing tubercle bacilli. It is still a debatable question whether it is the number of tubercle bacilli present on the sputum, or their prolonged contact with the intestinal mucosa that is the important factor in the infection. No one will dispute, however, that tubercle bacilli must be present in the sputum to cause the infection. This brings us to another important fact in the pathogenesis of intestinal tuberculosis, viz., there must be a degenerating ulcerative pulmonary lesion present; in other words, active pulmonary tuberculosis must be present. The patient with a healed inactive pulmonary lesion is very unlikely to develop tubercu-

lous enteritis. As a matter of fact, even patients with active pulmonary tuberculosis, but in the minimal stage, very rarely develop tuberculous enteritis. In 575 cases of secondary ulcerative intestinal tuberculosis reported by Lawrason Brown,⁵ only 9 occurred in patients in the minimal stage. In the same group studied, 291 occurred among patients in the moderately advanced stage and 275 among those in a far-advanced stage.

Since the clinical symptomatology of intestinal tuberculosis simulates many non-tuberculous diseases of the intestines, and since the roentgenologic picture presents no pathognomonic findings, the presence or absence of active pulmonary tuberculosis often remains the most important aid in the differential diagnosis of such cases. At least, we are justified in assuming that the complicating disease is not tuberculous, if the patient has an inactive, healed pulmonary lesion, or even if the lesion happens to be active but in the minimal stage. This fact is often true in the case of other extrapulmonary complications. With the exception of the very rare cases of primary extrapulmonary tuberculosis, and with the exception of the few cases in which implantation has taken place during the primary phase of pulmonary tuberculosis and in which the primary focus may have become healed, the great majority of extrapulmonary tuberculous infections are secondary to active pulmonary tuberculosis. Whether the implantation into the other organs has taken place through the hematogenous route or by direct contact, the primary focus in the lungs must be active and usually moderately or far advanced. The converse is, therefore, also true, namely: if a patient having inactive healed pulmonary tuberculosis develops an extrapulmonary complication, this complication is most likely of non-tuberculous origin.

Summary—Three cases of extrapulmonary non-tuberculous disease simulating intestinal tuberculosis and occurring in patients with pulmonary tuberculosis are presented. The infrequency of extrapulmonary tuberculosis in cases of minimal pulmonary tuberculosis especially with inactive healed lesions is stressed, and the importance of considering the likelihood of non-tuberculous disease in such cases is emphasized.

Los Angeles Sanatorium

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Pulmonary Actinomycosis

CHARLES J. KOERTH, M.D., J. M. DONALDSON, JR., M.D., and
C. C. PINSON, M.D.*
San Antonio, Texas

Actinomycotic infection in man is comparatively rare. Lord¹ was able to find only 65 cases in 122,408 admissions to the Massachusetts General Hospital while Sanford and Voelker,² in 1925, were able to collect statistics on 670 cases in the United States. In 12,000 consecutive autopsies³ at Johns Hopkins Hospital, only eight of the deaths were found to be due to actinomycosis and of these only one was considered to be a primary pulmonary infection.⁴ Of all cases of actinomycosis, 14 per cent are of the thoracic type. The most common site of actinomycotic infection is the cervico-facial region in which 60 per cent of all cases occur. The majority of cases of actinomycosis reported have been in males.

Case Report

P. K., age 31, a housewife, was admitted to the Robert B. Green Memorial Hospital on May 2, 1940, with the chief complaints of productive cough, and draining sinuses in the left chest, posteriorly. She injured her chest in an automobile accident in November of 1939. The site of the injury became swollen and painful, and a lesion resembling a carbuncle developed. This lesion ruptured in February, 1940. Purulent material began to drain from the resulting opening and air was drawn into and expelled from this orifice with each act of respiration. The patient had lost much weight. She had had pertussis when three years old and epileptic attacks all of her life. Her blood Wasserman had been positive since 1930. The family history was irrelevant.

The physical examination upon entrance

revealed an emaciated white female who appeared chronically ill. The heart rate and rhythm were normal. The thoracic muscles were wasted but equal expansion was observed on both sides. Dullness was present over the left chest, posteriorly, with rales in the base. A broncho-pleuro-cutaneous fistula presented several openings in the left chest wall, posteriorly. The abdomen and extremities were negative. The temperature was 98.6°.

Many pus cells and rare erythrocytes were present in the urine. The erythrocyte count was 3,200,000; the leucocyte count was 44,-

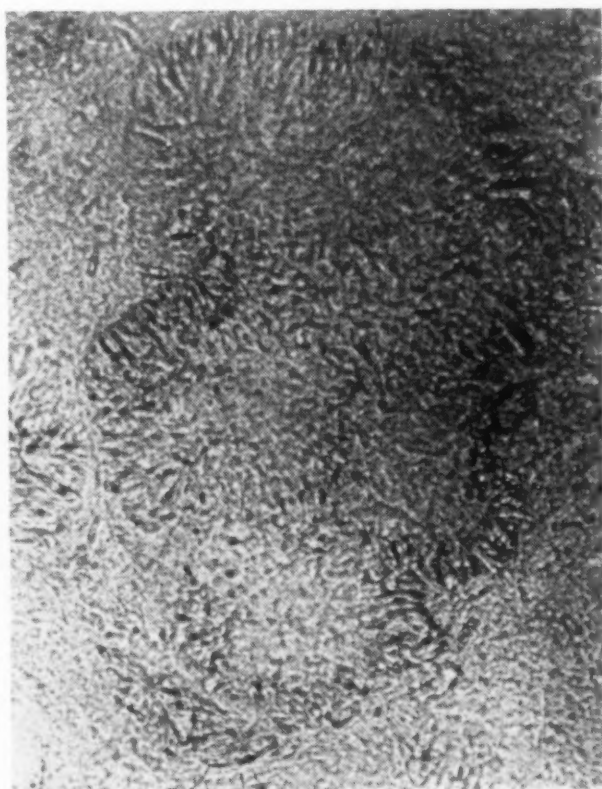


Fig. 1. Numerous "sulphur granules" were found upon microscopic examination of sputum.

* From the Woodmen of the World War Memorial Hospital.

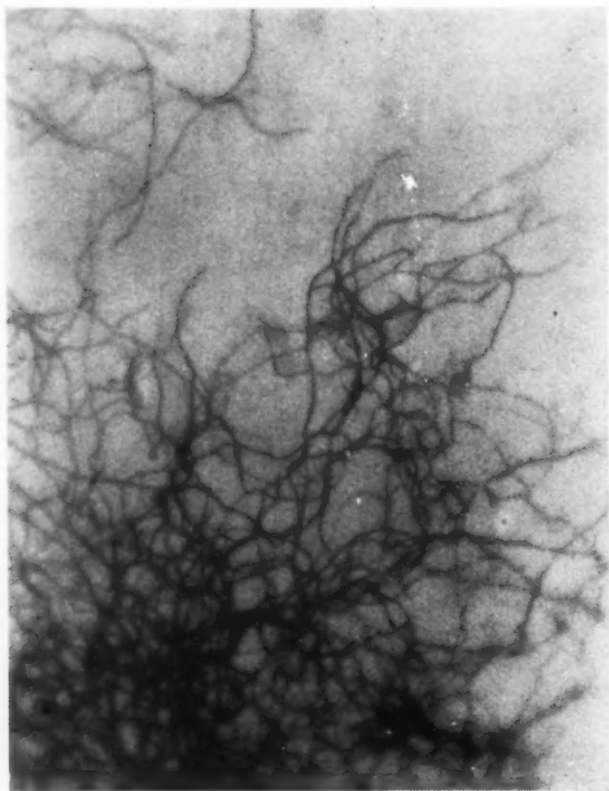


Fig. 2a. Slide cultures of the organism produced a thickly matted mass of acid-fast mycelia.

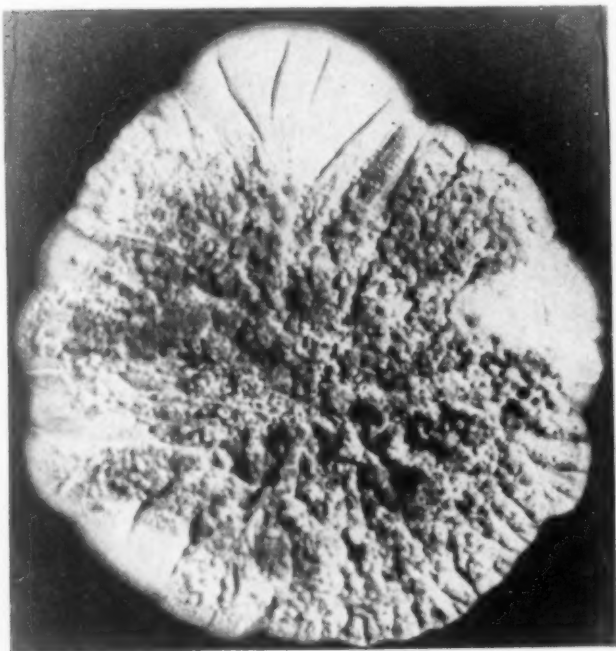


Fig. 2b. A giant colony grown on Krainsky's medium was irregular in outline and had a convoluted surface. The organism was a pinkish white in color and produced a dark red pigment which diffused throughout the medium.

700; hemoglobin 51 per cent; polymorphonuclears, 93 per cent; lymphocytes, 4 per cent; monocytes, 1 per cent; eosinophils, 0 per cent. The Kahn was three plus; and the sputum was negative for tubercle bacilli, both upon direct examination and culture. "Sulphur granules" were found in the sputum upon examination of a "wet preparation" (Fig. 1), and culture of the sputum produced a growth of acid-fast actinomyces (Figs. 2a and 2b).

X-ray examination (Fig. 3) revealed a moderate infiltration throughout the right lung, especially marked in the middle and lower lobes. An area of increased density was seen extending along the periphery of the left lung from the first interspace to the dome of the diaphragm.

On May 22, 1940, left thoracentesis resulted in the removal of 450 cc. of fluid, the first portion of which was yellow in color while that removed at the end of the aspiration was tinged with blood. This exudate was negative for tubercle bacilli. Subcutaneous emphysema developed over the left chest and the upper portion of the abdomen on May

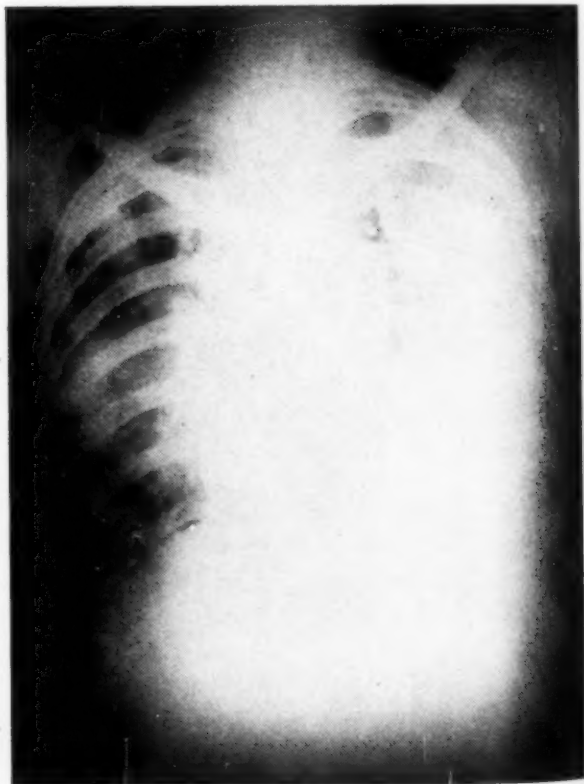


Fig. 3. X-ray examination revealed a moderate infiltration throughout the entire right lung. An area of increased density was present along the periphery of the left lung from the first interspace to the dome of the diaphragm.

25, presumably from the puncture made when the chest was aspirated. On May 30, 1940, under local anesthetic, a portion of the skin edge of one of the draining sinuses was removed for tissue study. The pathological report given by Dr. W. V. Knoll was as follows: "A ragged piece of tissue measuring 1.5 cm. by 1 cm. by 2 mm. presented one epithelial surface while the opposite surface consisted of a firm rubbery grayish yellow structure. A microscopic section stained with hematoxylin and eosin showed marked infiltration of inflammatory exudate with many neutrophils. One giant cell was present but no fungus mycelia were found."

The patient ran a septic temperature ranging from 96° to 102.2° F., reaching 103.6° a day before her death which occurred on June 4, 1940. A request for an autopsy was refused.

The actinomyces was cultured on various media with the following characteristics noted: On carrot infusion agar, colonies round, yellowish white, adherent to the substrate; Sabouraud's and Krainsky's agar, colonies round with irregular edges ranging in color from yellow and pink to lavender with a dark brown pigment diffusing throughout the medium; on broth, surface growth with fine sediment. Milk coagulated. Gelatin liquified. No gas production was noted in sugar broth cultures but acid was produced in dextrose broth.

Pulmonary actinomycosis may closely simulate pulmonary tuberculosis in its clinical manifestations. The onset of the disease is gradual, with weakness, loss of strength and weight, and with the later appearance of productive cough. The sputum is usually mucopurulent and contains the "sulphur granules" characteristic of the infection. Intermittent fever, night-sweats, chills, hemoptysis, pain in the chest, emaciation, and anemia may be present. With progression of the pathological process, involvement of the chest wall occurs with the formation of an abscess in an intercostal space. This abscess will eventually rupture and form a draining sinus. Physical examination reveals no signs characteristic of this disease. Signs of infiltration are usually observed over the bases of the lungs, a fact which is an aid in distinguishing pulmonary tuberculosis from pulmonary actinomycosis. However, if the in-

volvement is not confined to the lower lobes of the lungs its similarity to tuberculosis is increased. Collections of pus may occur in the pleural cavity¹⁵ but usually the pleurae are sealed together by the inflammation thus obliterating the pleural space. Involvement of the ribs and sternum often occurs. In the absence of erosion of the ribs there is no roentgen sign upon which to base a diagnosis of actinomycosis.

The early lesions of pulmonary actinomycosis consist of a central area composed of polymorphonuclear cells and filaments of the ray fungus. Surrounding this area is a ring of necrotic cells and cellular debris, while encircling this zone is another composed of typical granulation tissue. Giant cells and endothelial cells may be present. This disease spreads by means of the direct continuity of tissues and, unlike tuberculosis, ignores anatomical boundaries.⁶

Four types of pulmonary actinomycosis have been described.⁵ In the bronchitic type the infiltration is confined to the bronchi and is characterized by the presence of pus and fungi in the bronchi. This type of lesion is probably the first stage of each infection produced by inhalation of the organism. The pneumonic type presents a picture resembling an ordinary bronchopneumonia in which the process spreads from the bronchi into the adjacent alveoli which are filled with pus. As the lesion progresses, the alveoli first affected show an attempt at healing by the replacement of the inflammatory exudate with connective tissue, producing a fibrous nodule. In other areas there is no production of fibrous tissue but the alveolar walls are eroded and small abscesses are formed. Coalescence of these abscesses produce the large pulmonary cavities usually seen when the patient comes to post mortem. In the pleuropneumonic form, the abscesses are large¹¹ and the infection has involved the pleurae. The inflammation usually produces a pleuritis which obliterates the pleural space. In some instances collections of pus may obtain in the pleural cavity. The pus often penetrates the chest wall and produces a sinus in an intercostal space, or a rib may become involved.^{9,10} Perforation of the diaphragm may also occur.^{15,16} As is readily seen, these three types are but successive stages of the same process. The fourth type

is a metastatic process. Isolated nodules are present throughout the lung parenchyma. It is questioned whether this type really represents a blood stream dissemination¹⁴ for these nodules are rarely found in the liver or kidneys as would be expected in a metastatic process. It is possible that these are in reality due to a bronchogenic spread even though their relation to the bronchi cannot be demonstrated.

An absolute diagnosis cannot be made without isolating and culturing the organism or by finding the characteristic "sulphur granules" in the sputum. Culturing of the organism is beset with difficulties for, due to the slow growth of the actinomyces, it is often overgrown by organisms which are secondary invaders. The granules are not formed in rapidly progressing cases but only when there is a prolific production of connective tissue and their presence in the pus has been construed to be significant of considerable tissue resistance to the invading organism. The "sulphur granules" may be sterile in cases of long standing and thus thwart an attempt to culture the organism.

Although long considered to be pathognomonic of actinomycosis, the "sulphur granule" has been found in pus from conditions entirely unrelated to actinomycosis. Inspissated particles of pus may resemble the granule upon gross inspection but microscopic examination will reveal its true nature.

There is no characteristic blood picture; however, there always occurs an elevation of the leukocyte count. No specific agglutinins have been demonstrated in the blood serum of the patient.

Potassium iodide^{8,17,18} orally, in increasing doses to the point of tolerance, has been used in the treatment of pulmonary actinomycosis. Lipiodol intratracheally and intramuscularly¹³ have been used. The roentgen ray has produced favorable results in the hands of some investigators. Among other things used in the treatment of this disease are the internal administration of arsenic, copper sulphate, and oil of eucalyptus. Specific vaccines have been employed with indifferent results. Surgical¹² removal of the involved tissue has been productive of good results in many forms of actinomycosis but has not yielded striking results when employed in the pulmonary type. As evidenced

by the multiplicity of the types of therapy suggested, there is no single satisfactory one.

Summary

1) A case of pulmonary actinomycosis was presented in which the characteristic "sulphur granules" were present in the sputum and from which an aerobic acid-fast actinomycetes was isolated.

2) A brief discussion of the incidence of pulmonary actinomycosis, its symptomatology, physical signs, roentgen picture, pathology, diagnosis, and treatment was offered for consideration.

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Ambulatory Bilateral Pneumothorax

OREN A. BEATTY, M.D.*
Glasgow, Kentucky

The purpose in making this report is twofold: (1) to show that bilateral pneumothorax is a practical and life-saving procedure in ambulatory patients who cannot have sanatorium care, and (2) that it is a safe procedure when the technique employed is extraordinarily careful.

Experience in treating tuberculosis in ambulant patients gives rise to the opinion that it can be treated successfully and adequately when and if it is discovered early. The early diagnosis of tuberculosis may eliminate the necessity of so many sanatorium beds, provided there is the proper set-up and a qualified personnel for treating the ambulant patient after the diagnosis is made. Unquestionably, there is a dire need for sanatorium beds in many states and it will be many years before this need is supplied, but with a set-up that has been described in a previous paper¹ ambulatory treatment may play a great role in controlling tuberculosis until a hospital bed is available to every patient. A large group of these unfortunate patients may have recourse to pneumothorax which, of all the surgical procedures used in the treatment of tuberculosis, adapts itself more favorably to ambulatory treatment than all the others. Pneumothorax should be utilized to the fullest extent where indicated and bilateral pneumothorax is a safe procedure in ambulatory patients.

Technique of Administration

The success of ambulatory bilateral pneumothorax depends on the technique of administration. It has been said that the complications and accidents of bilateral pneumothorax are more than twice those of unilateral pneumothorax. What probably is true

is that most of the complications and accidents of unilateral pneumothorax are subclinical and may go unnoticed on account of the other uncollapsed lung; whereas, in bilateral pneumothorax the same complications and accidents develop with marked symptoms because of the lowered vital capacity due to both lungs being collapsed.

The usual choice of site is an interspace just below the inferior angle of the scapula. The skin and subcutaneous tissues are anesthetized with 1 per cent novocain down to the parietal pleura. The course of the anesthetizing needle goes by the upper border of the rib and to the parietal pleura which may be infiltrated without puncturing it. For the initial treatment an ordinary twenty gauge needle is used. It is inserted slowly, firmly and directly with full control of its motion and without deflecting its course. During the insertion of the pneumothorax needle the eye is kept on the manometer constantly because it is the most accurate indicator of the location of the point of the needle. As soon as the least perceptible motion of the water column is detected, the course of the needle is arrested. If the pressure is negative and the oscillations free, the needle is held stationary and 50 cc. of air is allowed to flow into the pleural cavity; but if the oscillations are not free, the needle is gently pushed the smallest distance further and if still they are not free, the needle is removed and cleaned of water droplets, blood or pieces of tissue. The process is then repeated and usually 250 or 300 cc. of air is given during the first treatment. In describing the technique of the initial insufflation, Packard, Hayes and Blanchet² recommended the use of a blunt tipped needle. When they thought the point of the needle was in the pleural space, the passageway between the

* Chest Clinic, T. J. Samson Community Hospital, Glasgow, Ky.

needle and the manometer was opened to watch for fluctuations. This passageway should be kept open from the beginning because the manometer is as important in the first insufflation, to tell you the location of the point of the needle, as at any subsequent time. This is particularly true in bilateral pneumothorax. Alexander³ described the use of a blunt tipped needle in the initial insufflation but the connection between the manometer and the pleural cavity is kept open so that it may be observed when the needle enters the pleural cavity. He advised guarding against the danger of the sudden plunge of a dull needle.

Full control of a blunt tipped needle is almost impossible and there is danger of puncturing the lung. It tears through tissues and on account of the pressure needed to push through the tougher layers of tissue, it will often suddenly push into others before its course can be arrested. Packard, Hayes and Blanchet² described the "snapp" felt and oftentimes heard in using the blunt needle. Too much trauma is caused when there is this much resistance; whereas, with the sharp pointed needle there is very little difference in resistance of tissues and the course of the needle can be arrested at any point. On account of the negative intrapleural pressure found in a free pleural space, it is not necessary that all of the lumen at the bevel of the needle be in the intra-pleural space in order to get oscillations. When only a small part of the lumen is in the intra-pleural space there is not enough of the sharp point of the needle to lacerate the visceral pleura. In case the pleura is adherent, producing less oscillations, puncture of the lung in this case could not be serious. The negative intrapleural pressure found in a free pleural space keeps the passageway open at the lumen even if all of it is not in the pleural cavity because the change in negativity is only relative. If the pressure were positive, then there might be a flap valve-like effect.

When refills on the two sides come simultaneously, they are given at the same time. No particular effort is made to have the refills for each side come on different days unless there is some unusual reason, but rather an effort is made to give both refills on the same day when they fall close

together, because this saves the patient extra effort and expense if he has to come a long distance. When both treatments are given simultaneously, it should be considered which side to give first. If quite a reserve of vital capacity is present it does not matter which side is refilled first. If the vital capacity is low and one lung is completely collapsed and this collapse has to be maintained, then it is better to refill the completely collapsed side first. The other side may then be pushed down short of the point of dyspnea if necessary. The same technique as in the initial insufflation should be observed in subsequent refills.

Indications for Bilateral Pneumothorax

The chief indication for this form of treatment is bilateral disease that is progressive in spite of bed rest. It is more successful in the early cases before adhesions have formed. It may be tried in the far-advanced bilateral cases, but in these adhesions are often encountered. In the far-advanced cases one lung may be completely involved and require a complete collapse. Unless the disease is located favorably for selective collapse in the other lung, an attempt to collapse the lung sufficiently may lower the vital capacity to the point of severe dyspnea. Also, when one lung requires a complete collapse and a cavity is centrally located among the larger bronchi in the other it is difficult to collapse to the point of cavity closure because of the "tent pole" effect of the bronchi. Adhesions that would not prevent closure of cavities in unilateral pneumothorax may do so in bilateral pneumothorax because pressure pneumothorax would produce its greatest collapse on the unadhered portion of the lung.

The Best Results may be obtained in the following types of cases:

- 1) Bilateral progressive diseases in which the lesion occurs in the upper lobes and toward the apex of each lung.
- 2) Bilateral progressive disease in which the lesion may be basal on one side and apical on the other, and
- 3) Bilateral progressive disease which is yet of only moderately advanced extent.

The Poorest Results may be obtained in the following types of cases:

- 1) Extensive disease in one lung requiring

complete collapse of the lung with a moderately advanced lesion in the upper lobe of the opposite side.

2) Extensive disease in one lung requiring complete collapse with a root region lesion or cavity in the other lung.

3) Extensive disease in one lung requiring complete collapse with moderately advanced lesion in the upper lobe of the opposite lung with adhesions.

4) Adhesions in one or both sides preventing cavity closure in one or both lungs.

5) Bilateral exudative tuberculosis.

Contraindications to Bilateral Pneumothorax

There are no contraindications to bilateral pneumothorax more than the usual contraindications such as senility, asthma, heart disease, emphysema and extensive disease. It has been noted that the patients who require complete collapse of one lung due to extensive disease respond more slowly to bilateral collapse. A cavity that occurs near the root region of the good lung is difficult to close when the opposite lung has to be completely collapsed due to extensive disease. Refusal of the patient to completely stay in bed after the first few treatments is not necessarily a contraindication. In fact, it may be an indication, because this type of patient will be likely to have a progressive lesion.

Complications and Accidents

There were one complication and two accidents in these thirteen bilateral pneumothorax cases. The complication was a bronchopleural fistula with a tuberculous empyema in a patient who refused to stay in bed after the first few bilateral treatments. He did well for several months until he developed and died of a tuberculous empyema and pneumonia. The accidents were one spontaneous pneumothorax and one massive collapse. The spontaneous pneumothorax followed giving the initial bilateral treatment in the clinic and allowing the patient to return home without a period of bed rest. This lung was successfully reexpanded at home and the patient died over a year later of extension and progression of the disease. The massive collapse occurred in the right lung in a bilateral pneumothorax case on the operating table following a left phrenic

crushing. This phrenic crushing was done in order to close a cavity on the left that was strung up by an adhesion. When the massive collapse occurred, sufficient air was withdrawn from the left pleural cavity to relieve the severity of the dyspnea. Later the massive collapse cleared up but the cavity in the other lung has not closed and the patient is unimproved. The third fatal case was the only negro on which this treatment was tried. His disease seemed to progress more rapidly under bilateral pneumothorax. The other nine cases have improved to a marked extent under bilateral pneumothorax.

Discussion

This report is based upon thirteen cases of bilateral pneumothorax. This is not a large number of cases, but is a fair sized group of patients to be treated ambulatorily. Strictly speaking, these patients are not truly ambulatory but they stay in bed at home and return at stated intervals for refills. Most of them have stayed in bed well, but at least two have refused to stay in bed following discharge from the hospital and were truly ambulatory. Many of the others to my knowledge took unreported privileges.

Most of these cases have had unilateral pneumothorax for a few months or longer before the bilateral pneumothorax was initiated. In one patient there were only twelve days between the initial treatment of the two sides. The refills may fall on the same or different dates for the two sides. Only one patient was allowed to return home without hospitalization. All the others were hospitalized one to two weeks during initiation of the bilateral pneumothorax. Only one patient was kept in the hospital as long as three weeks and this was the patient who had collapse of both lungs initiated only twelve days apart. After leaving the hospital these patients returned to the clinic or to the office for refills.

It is difficult to compare the results in this group of bilateral pneumothorax cases with those of unilateral pneumothorax because this is a selected group of patients. It is a group in which unilateral pneumothorax was not sufficient and if bilateral pneumothorax had not been initiated, the results would have been 100 per cent unsuccessful, whereas in unilateral pneumothorax all types of cases

are represented. But in spite of this difficulty, a recent analysis¹ of cases, as previously reported, showed the mortality rate in the unilateral pneumothorax cases to be 32.5 per cent and in the bilateral cases 30 per cent.

Before leaving the discussion it might be well to mention the effect of bilateral pneumothorax on the heart. In fact, clinically no definite effect has been noted. The few times dyspnea has been produced has apparently been due to a decreased breathing space and not to any pressure effect upon the heart. With free pleural spaces bilaterally there is likely to be no clinical effect upon the heart, but it is conceivable that a combination of adhesions with high intrapleural pressures could produce an embarrassing effect upon the function of the right side of the heart.

The statistics of these cases, such as cavity closure, sputum conversion, etc., have not been reported in detail because that was not within the purpose of this paper and this is too small a series of cases for reporting such statistics, but the table represents some essential facts concerning these patients. It is not too small a group to demonstrate that bilateral pneumothorax is a safe and practi-

cal procedure in ambulatory cases in experienced hands and may prove another weapon in fighting tuberculosis in a large number of southern states where sanatorium beds are not available for all tuberculous patients.

Conclusion

In conclusion, three of thirteen bilateral pneumothorax cases died and one is unimproved. All the others improved or better. The remarkable thing is that all thirteen of these patients would be either dead or terminal cases had it not been for bilateral pneumothorax, which was carried on ambulatorily without sanatorium beds available. Bilateral pneumothorax is a safe and practical procedure in the ambulatory treatment of tuberculosis in trained hands.

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NAME	Age at time of bilateral pneumothorax	Time of collapse of first lung	Time of collapse of second lung	Pneumothorax discontinued	Condition at present	Color	Complication	Accident
E. D.	19	Rt. 8-13-37	Lt. 11-22-23	9-4-39	9-6-39 Dead	W	Broncho Pleural Fistula	
V. A.	18	Rt. 8-17-35	Lt. 12-28-36	Lt. 12-28-39	Improved	W		
M. R.	23	Lt. 11-19-36	Rt. 6-21-38	Discontinued	12-6-39 Dead	W		Spon. Pneumo.
A. S.	48	Rt. 1-18-37	Lt. 5-23-39	Lt. 5-7-40	Arrested	W		
B. A.	38	Rt. 7-15-37	Lt. 4-23-40		Improved	W		
T. R.	28	Lt. 4-12-40	Rt. 8-2-40		Improved	W		
W. T.	23	Lt. 9-15-39	Lt. 12-2-39		Improved	W		
A. R.	24	Rt. 6-9-37	Lt. 1-10-39	Rt. 11-8-38 Lt. 2-27-40	Unimproved	W		Massive Collapse
L. C.	39	Rt. 5-23-38	Lt. 9-5-39		Improved	W		
L. B.	17	Approx. Oct. '37—Rt.	12-37—Lt.	Took last treatment 11-12-40	Pregnant Improved	W		
O. G.	23	Rt. 10-13-36	Lt. 3-30-37	Both sides 9-7-37	6-28-39 Dead	B		
A. D.	31	Lt. 11-2-36	Rt. 6-11-39	Both sides 9-16-39	Arrested	W		
L. M. C.	22	Lt. 9-7-40	Rt. 9-19-40		Improved	W		

TABLE: Essential Facts Concerning Bilateral Pneumothorax Cases.

Allergic Cough

SAMUEL J. PRIGAL, M.D.
New York, New York

The respiratory tract is the principal allergic shock organ. Such diseases as seasonal hay fever, perennial hay fever (allergic or vasomotor rhinitis), and asthma have long been recognized and treated on an allergic basis. Polyposis of the nasal mucous membrane¹ is considered to be an allergic phenomenon. Recently, evidence has been presented to prove that bronchiectasis² is a late manifestation of a fairly common and unrecognized condition: allergic bronchitis.³ It is the purpose of this contribution to describe another condition, allergic in nature, involving the respiratory tract; namely, allergic cough.

This is usually a loud barking cough of such intensity and force (like the sneezing in hay fever) that it draws the attention of all within hearing radius. It is paroxysmal in nature, relatively nonproductive, may last from a few minutes to hours or days, and defies analysis by the usual method of examination. Radiographic examination of the chest and examination of the sputum are negative. Physical examination of the chest is entirely negative. The patient does not look or feel sick, the usual complaint is of an itchy, scratchy or rubbing sensation deep in the throat, and this irritation reflexly leads to coughing spells.

Although allergic cough resembles the cough of the asthmatic in many respects, the two can be differentiated readily. In the former the chest examination is negative. In the latter, sibilant and sonorous rales and prolonged expiration are found. Again, the asthmatic is dyspnoeic and usually complains of pressure over the sternum. In allergic cough there is no obstruction to respiration and none of the other complaints.

The allergic nature of this cough is characterized by certain phenomena common to all allergic diseases.⁴ There is: (1) the marked familial history of allergy as well as (2) history of past and/or concomitant allergic conditions such as urticaria, eczema, gastrointestinal allergy, migraine, etc. (3) Sensitivity to allergens are readily demonstrable by skin testing. (4) There is therapeutic re-

sponse to epinephrin and related drugs. (5) The illness is periodic. Contact with the allergens produces the cough; removal leads to periods of freedom. (6) The sensitivity can be reduced by immunization with the allergen concerned, particularly if it is an inhalant.

Like the other allergic diseases of the respiratory tract, particularly hay fever and asthma, the cases of allergic cough may be grouped into two categories—Seasonal and Perennial. Some cases fall into both, as in hay fever and asthma. The seasonal cases coincide with the pollens. Positive but slight reactions are obtainable by intradermal testing with 1 per cent or 2 per cent solutions of pollen. Weaker solutions are negative as a rule.

The perennial cases show positive reactions to such common inhalants as house dust, feathers and other animal danders, orris root, tobacco and pyrethrum. Most of the positive reactions in the inhalant groups prove to be actual causative factors by clinical trial.

Although positive skin tests to foods were obtained, it was only rarely felt that this was of clinical significance. A few cases to illustrate allergic cough are presented briefly:

Seasonal

Case 1—A. S., male, age 54, was first seen January 11, 1937, complaining of a severe non-productive cough since August 1936, worse indoors, interfering with work and sleep. One daughter has asthma, another gastrointestinal allergy.⁵

Although his present cough dates back only a few months, he states that beginning with the fall of 1915, he had a similar cough occurring each year late in August and ending with the frost, but gradually extended into the winter months. At no time did he have nasal symptoms suggestive of hay fever. There was never any dyspnoea, wheezing, or difficulty in expiration. Suspicious of tuberculosis, the Board of Health kept him under observation for a number of years. Roentgenograms of the chest and the sputum examinations were performed repeatedly

by this agency, and by private physicians as well, and proved to be negative. Examination of the heart and lungs revealed no cause for the cough. There was no evidence of an upper respiratory infection, post-nasal drip, or nasal allergy.

Intradermal testing gave positive test with ragweed (mixed), house dust, feathers, dog dander, wool, tobacco, pyrethrum, egg-white, corn, chocolate, coffee, tea, oats, tomato, cabbage, English walnut and buckwheat. Clinically, the patient proved to be sensitive to ragweed, house dust, pyrethrum, and buckwheat.

The treatment consisted of immunization with house dust and ragweed and of the elimination of the other offenders. Ephedrine was given by mouth. The results were startling. After the first treatment the coughing spells were markedly reduced and the patient was able to sleep through an entire night.

Further injections with dust and ragweed resulted in complete amelioration of the distressing cough. These injections were continued throughout that winter and spring into the fall. There were no symptoms during the ragweed season. To date the patient gets only an occasional coughing spell although there has been no treatment since October 1937.

Comment—Allergy was suspected in this case because of the seasonal onset and occurrence of the cough, the allergic family history, and the negative physical findings. That this suspicion was justified is proved by the excellent results obtained through allergic investigation and treatment. Although tobacco was not involved in the production of the cough, the positive test was significant because in the past year the patient complained of intermittent claudication, diagnosed as thrombo-angitis-obliterans, which is considered by Harkavy⁶ and Sulzberger⁷ to be a vascular allergic reaction. Relief from the claudication was obtained by the cessation of smoking.

Case 2—E. H., age 53, male, sought consultation on September 9, 1937, because of a severe and almost continuous dry cough three weeks in duration. He recalled that in 1935 he had a similar coughing spell which started about August 15 and lasted into early October. It has been so severe and was so

unresponsive to the usual medication that he had been referred to a hospital where x-ray and other laboratory studies had been made. These proved negative. With the onset of winter, his cough disappeared completely, only to recur in August 1936. The same occurred again in August 1937. The present cough was unassociated with any nasal symptoms. The family history was essentially negative for allergy, except that a daughter was subject to mild wheezing without dyspnoea. As a young man, the patient suffered from severe headaches (migraine).

Percussion, auscultation, and fluoroscopy of the chest were negative. There was no evidence of nasal allergy or infection.

In view of the seasonal nature of the cough, the patient was tested intradermally with ragweed and found sensitive. Other inhalant sensitivities included house dust, goat epithelium, fish glue, rabbit epithelium, cotton seed, tobacco and kapok. Of these, kapok and house dust were considered of importance. His kapok pillow was enclosed in an allergen-proof casing and treatment was instituted with both the house dust and ragweed extracts. Response was immediate and excellent. The patient did not return for pre-seasonal treatment with the ragweed in 1938, but nevertheless had no return of similar symptoms in the fall of that year.

Comment—Here again the seasonal occurrence of the cough and the allergic history (migraine) led to the correct diagnosis and treatment. The cough follows the typical pattern of pollinosis, hay fever, and asthma. Symptoms appeared about the fifteenth of August, gradually became worse and reached their zenith the first week of September, at the height of the pollen season.

A number of cases summarized below (see chart) showed their symptoms, during June and July when the grasses and plantain pollinate (cases 3, 4, 5, 6, 7). No cases were seen which were sensitive to the pollens of the trees.

Perennial

Case 3—Miss L. K., age 33, was referred for an allergy examination in October 1936 primarily because of urticaria. On questioning, she also suffered from a severe cough, 12 years in duration. It was perennial, but worse in the summer and fall, was non-pro-

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Case No.	Age	Sex	Duration of Cough	Seasonal or Perennial	Associated Types of Allergy	Positive Skin Tests	Clinical Sensitivity	Treatment	Results
1 A. S.	54	M	22 years	Seasonal	Thrombo-angiitis obliterans (?)	Ragweed, house dust, feathers, dog dander, wool, tobacco, pyrethrum, egg white, corn, coffee, tea, chocolate, oats, tomato, cabbage, Eng. walnut, buckwheat	Ragweed, house dust, pyrethrum, buckwheat	Immunization with house dust and ragweed	Excellent
2 E. H.	53	M	3 years	Seasonal	Migraine	Ragweed, kapok, house dust, goat and rabbit epithelium, fish glue, cotton seed, tobacco	Ragweed, house dust, kapok (?)	Immunization with house dust and ragweed	Excellent
3 L. K.	33	F	12 years	Perennial	Urticaria Migraine	House dust, orris root, ragweed, timothy, plantain, orange, lima bean, mustard, green pea, haddock, codfish, tomato	House dust, orris root, ragweed, timothy, plantain	Immunization with house dust, orris root and pollens	Poor—No cooperation
4 J. P.	67	M	Life-long	Perennial	None	House dust, timothy, plantain, rye	House dust, timothy, plantain, tobacco, rye, tea	Immunization with house dust and pollens	Good
5 R. M.	4	F	3 years	Seasonal	Urticaria	House dust, timothy, plantain	Timothy, plantain	Immunization with timothy and plantain	Excellent
6 M. M.	30	F	3 weeks	Seasonal	None	Timothy, plantain	Timothy, plantain	Immunization with Pollens	Excellent
7 E. N.	5	F	2 years	Seasonal	None	Timothy	Timothy	Immunization with timothy	Excellent
8 G. B.	40	F	9 years	Seasonal	None	Timothy, plantain	Timothy, plantain	Refused	Seasonal cough continues
9 M. H.	48	F	1 month	Seasonal	None	Timothy, plantain, house dust	Timothy, plantain, house dust	Immunization with timothy, plantain and house dust	Good
10 M. M.	44	F	2 years	Perennial	None	House dust	House dust	Immunization with house dust	Good
11 L. DeR.	50	M	10 years	Perennial	None	House dust	House dust	Immunization with house dust	Good
12 J. M.	43	M	4 years	Perennial	GI allergy	House dust, most animal danders, ragweed, tobacco	House dust, tobacco, ragweed	Immunization with house dust and ragweed	Slight

ductive and was unassociated with any fever, night sweats, or loss of weight. Repeated examinations, including many radiographs of the chest and sinuses, were negative. Trips to Florida and Arizona were of no avail. A most thorough examination in a large diagnostic clinic, including bronchoscopy, was negative.

The family history was negative for allergy or tuberculosis. In addition to hives and the cough, the patient was subject to severe attacks of migraine. She was aware that pears, pumpernickel bread and carp produced hives. She noted, also, that reading the colored comics or the rotogravure section of the Sunday newspapers made her cough spasmodically. She coughed a great deal in the subways, night clubs and theatres. The cough had been so severe as to interfere with her profession—singing.

Skin testing showed a multiple sensitivity both to foods and inhalants (see chart). Relative to the cough it was felt that positive tests to house dust, orris root, timothy, plantain and ragweed were significant; the patient was given injections with the house dust, orris root and ragweed with slight relief of her symptoms. For complete relief it was suggested that she refrain from the usage of perfume which she used in usual quantity, and that she abstain from visiting night clubs and theatres. This she refused to do and she still coughs.

Comment—This case showed many manifestations of allergy. It was therefore important to evaluate the role of allergy in the production of her cough. The patient was sensitive to pollens and had seasonal exacerbations of a cough which was always with her because of her sensitivity to house dust and orris root. This simulates the pattern of behavior of many cases of asthma and vasomotor rhinitis.

A bronchoscopy which was performed to rule out the presence of a malignancy in the bronchi as the cause of the cough failed to record the nature of the mucous membranes. A pale edematous mucous membrane would have been most convincing as to the role of allergy in the production of this severe cough.

Case 4—J. P., male, age 67, had a cough as long as he could remember. It occurred in spasms, and was particularly aggravated

by a dusty or smoky environment. He had been advised by a physician to give up smoking several years ago, and noted a marked improvement thereafter. There was a return of the cough in June of 1937 in spite of complete abstinence from smoking, and he sought consultation.

The family allergy history revealed a brother who was asthmatic, a nephew and a niece who were asthmatic, a son who has vasomotor rhinitis. The physical examination showed the presence of emphysema and some scattered rales in both bases. Occasional wheezing was heard. Outside of an accelerated respiratory rate due to the emphysema, there was no evidence of the respiratory distress of the asthmatic. In view of the allergic background, the patient was skin-tested and found sensitive to house dust, tobacco, timothy, plantain, and rye. His cough improved with treatment by injections of dust and the pollens. He was advised to avoid smoky atmospheres and not to eat rye. There was a return of the symptoms, but less severely in June 1938. No treatment was given. The patient has also observed that the drinking of tea will make him cough. He had been negative to tea by the intradermal testing.

Comment—Here we have a marked familial history of allergy which indicated the direction for investigation. The seasonal aggravation corroborated the impression that allergy was the basic cause of the cough. The role of tobacco in this case is interesting. The impression is that he is allergic to tobacco smoke even though the intradermal test was negative.

Discussion

Chronic cough is a problem with which the physician is constantly confronted. In a recent analysis of the problem, Keyton⁸ concludes that the most common causes of the chronic cough are an upper respiratory infection and the passive congestion resulting from cardiac failure. He lists altogether about 30 distinct causes of cough but does not mention the role of allergy. Pendergrass,⁹ in a similar study, also makes no mention of the role of allergy. Taylor¹⁰ stresses in particular the need for investigating the sinuses in determining the etiology of a persistent cough. Wyllie,¹¹ studying the problem of chronic

cough in children, mentions a cough of undetermined origin associated with colicky pains and mucous stools. This may be on an allergic basis, in view of the newer knowledge of mucous colitis.¹²

The role of allergy in the production of cough has been noted before. Colmes and Rackeman¹³ described two cases of allergic cough which they concluded was a forerunner of true bronchial asthma. This, however, has not been our experience. Only one case described here developed asthma. Clein¹⁴ stresses the importance of allergy as a cause of the frequent colds and chronic cough in children and refers to the earlier observations of Piness and Miller.¹⁵ Kahn¹⁶ has described cases of cough on allergic basis and has even produced the symptoms experimentally by overdosing the patient with the specific allergen. He also feels that this is preliminary to asthma, periods of coughing alternating with periods of asthma. He gets excellent results with anti-allergic therapy.

The site of the allergic reaction is a moot question. Kahn¹⁶ believes it to be in the trachea, and therefore labels his cases Allergic Tracheitis. We can only conjecture at this time, not having seen the shock organ involved. Our impression, however, is that the allergic reaction (edema of the mucous membrane) occurs deep in the throat, possibly involving the larynx. This is concluded from the fact that many of the patients complain of an itchy, scratchy or tickling sensation in that region. Also, periods of hoarseness is a rather frequent complaint. It is the edema of the mucous membrane involved that reflexly causes the cough. This is comparable to the itchy or tickling sensation in the nose of the hay fever patient which precipitates the sneezing spells.

It is well known that the entire respiratory tract beginning with the nose and down to the terminal bronchioles is subject to allergic reactions, as witness: hay fever involving the nose, asthma and allergic bronchitis involving the bronchial tree, and now allergic cough involving the respiratory mucous membrane between these two shock areas.

The so-called tobacco, or "smoker's cough," in many cases is probably explicable on an allergic basis, i.e., allergy to tobacco and smoke. Where other forms of allergy are present, the patient should be investigated

from the allergic point of view before concluding that the mechanical irritation of the smoke is the sole factor in producing the cough. Cases 4 and 12 show this clearly. Indeed, many an asthmatic obtains some slight relief from smoking, indicating that the mechanical and chemical irritation of the smoke is not always a factor in the initiation of the coughing spells. Where the patient is ragweed- or pyrethrum-sensitive, the role of tobacco must be particularly investigated in view of the close biologic relationship of these weeds.

Conclusions

1) A severe paroxysmal type of cough, unresponsive to ordinary treatment, is here described as a form of allergy.

2) The site of the allergic reaction (edema) seems to be deep in the throat about the larynx.

3) The allergic cough resembles other allergic phenomena in that: (a) It occurs in individuals with a marked personal and/or family allergic history. (b) The patient shows skin sensitivity by testing with allergens. (c) It responds therapeutically to immunization with the specific offenders, and (d) it is periodic. Exposure to the allergen produces symptoms. Removal of the allergen relieves the symptoms.

4) Cases of allergic cough may be grouped into two distinct categories: (A) Seasonal; (B) Perennial. The seasonal cases are due to the pollens commonly causing hay fever and asthma. Perennial cases are due principally to such inhalants as house dust, feathers, orris root, etc. Foods play but a minor role in the production of this type of cough.

144 West 86th Street

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The Road to Early Diagnosis

J. R. PATTON, M.D., F.A.C.C.P.*
Ogdensburg, New York

"A stitch in time saves nine."

No truer axiom could be applied to our program for the eradication of tuberculosis. Definitely, early diagnosis with proper treatment means, in a great majority of cases, early recovery.

How shall we pave this road to early diagnosis? This undertaking, in most instances, will be a community problem. Adequate organization of our official and unofficial health agencies is of paramount importance and must be undertaken with the idea of the correlation of these facilities. If these agencies are not already in existence, then measures should be taken to establish same.

It is presumed that in each locality, or at not too great a distance, there exists a sanatorium adequately equipped to treat tuberculosis in all of its forms, and where weekly or semi-monthly chest clinics are conducted, and to which the family physician may refer his patients. In addition, the sanatorium should be equipped to conduct clinics at remote points at frequent intervals for those who may not be able to come to the sanatorium.

Obviously, the larger cities, villages and industrial centers should receive the benefit of more frequent visits by the clinic.

Apriori, it is quite evident that we cannot wholly depend on the patient coming to the

sanatorium, but we must take the facilities of our clinic to the patient.

Furthermore, all health activities should be under the guidance of a District State Health Officer and his staff. Therefore, our two most important agencies in arriving at an adequate program for the control of tuberculosis are the sanatorium and staff of the District State Health Office and staff.

One of the most outstanding links in a successfully welded chain of endeavor in our program is the family physician. Only through his cooperation will our aims be achieved. He must refer the patient to the clinic for special examination and evaluation of findings. Obviously then, the family physician must show willingness to accept our aid; he must be familiar with the "earmarks" of tuberculosis; he must have a knowledge of the groups of individuals from which most tuberculosis results; he must be appreciative of the importance of examining, especially, the adult contact members of the household. The family physician should facilitate the immediate hospitalization of active tuberculous individuals; he must lend all aid in cooperating with the District State Health Officer and his staff of physicians and nurses in unearthing the source of infection. The physician duly and truly must report all his cases of tuberculosis and all deaths caused by tuberculosis immediately.

In many communities the County Welfare

* Medical Director, St. Johns Hospital.

Department is financially responsible for the care of tuberculous patients. This department should be in close cooperation with the district state health office and the sanatorium, and be furnished with current information regarding admissions of patients to sanatorium and discharges.

The economic welfare of the patient's dependents is of extreme importance since the care of a tuberculous patient is a Public Health charge and should not be the means of the pauperization of the family. By the same token, to avoid manifest tuberculosis in an infected family, adequate means should be provided to keep the hospitalized member of the family free from mental stress, and the members of the family free from mental stress and impoverishment. Thus, our county welfare organization will play an important part in our program.

A standing Public Health Committee which acts in an advisory capacity to the county welfare department is a very desirable factor.

How shall we educate the general public relative to the importance of what the word tuberculosis means; what one should do to determine the existence of tuberculosis; and in general what is being done to eradicate tuberculosis; and what has been done in the past to control this disease?

The way was made easier when, in 1903, a Danish postal clerk, Einar Holboell, arrived at the idea of offering to the public the Christmas Seals to raise money to care for sick children. Later, in 1907, Miss Emily P. Bissell of Wilmington, Delaware, introduced this method of fund raising for the control of tuberculosis in America. This received, immediately, the official sponsoring of Doctor Edward Livingston Trudeau and his National Tuberculosis Committee.

At the present time, there are in the United States and its possessions over 2,000 state, county, and city tuberculosis associations. Several millions of dollars derived from the sale of these penny stamps have contributed largely to financing ways and means of controlling tuberculosis and instituting proper legislative action. Under the leadership of well qualified executive secretaries, educational programs are continuously being carried on.

These organizations should be closely link-

ed to the district state health office and the sanatorium for guidance. They should keep the public ever cognizant of the means of eradicating tuberculosis. This may be done through newspaper publicity, meetings, talks, moving pictures, posters, window displays and radio broadcasts.

For the past several years the National Tuberculosis Association has instituted an Early Diagnosis Campaign during the month of April. They have worked in conjunction with official and unofficial health agencies in an educational manner to make the public tuberculosis minded; to educate them to the need of early discovery; and to the importance of contacting their family physician for early examination and x-ray. The County Tuberculosis Association, through its Speaker's Bureau, is able to contact lay organizations such as Parent-Teachers' Association, City Clubs, Granges, and Service Clubs, thus securing their cooperation in aiding the fight against tuberculosis.

Therefore, the work of the Tuberculosis Association in an educational manner is of definite importance in our efforts to discover tuberculosis in its incipency. We are all aware of the value of health education in preventive medicine.

Where shall we look for tuberculosis? On what groups shall we concentrate our efforts? Since tuberculosis leads in the cause of death in the age group from 18 to 35, we shall be ever mindful to include this group in our surveys.

May I, at this time, interject this statement: During the past two years a majority of newly discovered cases of tuberculosis in our county have been in the 40 to 60 age bracket, with sporadic cases between 60 and 74. It is quite evident that improved methods of searching for the source of infection is gradually bringing to light the so-called grandmother and grandfather tuberculosis spreaders, who have been undoubtedly, for many years, disseminating infection and were thought to be suffering with catarrh, asthma or bronchitis.

Groups to Be Examined

1) Obviously, adult household contacts will be the group from which our yield is most fruitful.

2) Those in low income and indigent

bracket.

3) Workers in dusty industries, especially those exposed to free silica, such as potters, tool grinders, miners in hard rock, workers using sand for polishing, facing brick, etc. A majority of companies engaged in dusty industries include an x-ray of the chest in the examination for employment. In St. Lawrence County a number of early cases of tuberculosis have been diagnosed as a result of this procedure. When, and if all employers follow this procedure, the discovery of early tuberculosis will be considered enhanced.

4) Medical students, nurses, and hospital employees.

5) Draftees and trainees for war industries.

6) University, college and high school students (those 15 years and over).

7) We have just spoken of the necessity of including an x-ray examination of the chest as a part of the physical examination of all applicants for employment. It is just as important to follow this procedure in making routine periodic examination of employees. Hospital workers, nurses and student nurses, interns and medical students should also receive the same type of medical supervision. It is an established fact that medical supervision of this class of worker is, at present, inadequate and it is assumed in many instances that they have some sort of special immunity to disease, but on the contrary, their duties are quite arduous, they are often fatigued, they are often exposed unknowingly to tuberculosis (in general hospitals) and therefore are more susceptible to tuberculosis.

We now have knowledge that many cases of tuberculosis are admitted unknowingly to general hospitals. In the general hospital of this city 19 cases of tuberculosis were discovered in 1940 by x-ray of the chest. A considerable number of new cases of tuberculosis have been yearly discovered by routine x-ray of the chest in a large mental hospital in this city. It has been estimated by Dr. Robert E. Plunkett and Dr. Edward Mikol, both of the New York State Department of Health, Albany, New York, that between 10 and 20 per cent of tuberculosis deaths occur in general hospitals; furthermore, that 10 per cent of adults admitted to general hospitals have clinical pulmonary tuberculosis.

On this basis, Drs. Plunkett and Mikol reported that it is estimated that more than 40,000 unrecognized cases of tuberculosis are admitted annually to general hospitals in this country. In two-thirds of these patients the disease could be discovered only by means of routine x-ray films of the chest. In my opinion, even more tuberculosis could be found in the mental hospitals.

8) Physical examinations for insurance usually do not require an x-ray of the chest. Heart examinations, blood pressure, urine examination, eye examination, etc., all are present, but no x-ray of the chest. In a number of instances, in my own experience, individuals have developed tuberculosis within a year or so after having successfully passed an examination for life insurance. Routine x-ray examinations in this group would materially aid our endeavors to discover early tuberculosis.

9) It is quite essential that applicants for employment as teachers should have an x-ray examination of the chest, since they will be in contact with the minor age groups and in a position to disseminate infection. Incidentally, for the past several years the laws of New Jersey have made this examination mandatory.

10) Another group which should have special attention in our program is the expectant mothers. We are all cognizant of the clinical course of tuberculosis when lighted up after delivery of the mother. Quite often the progress of tuberculosis in these cases pursues a rapid course to a fatal termination. Therefore, an x-ray of the chest of the expectant mother is quite as necessary as the Wasserman Test.

Early discovery of tuberculosis in the expectant mother and adequate treatment in many instances will allow her to give birth to a child with comparative safety.

We should enlist the cooperation of district and local health agencies, boards of education and physicians in stimulating the work in these groups.

An adequate case-finding program, including tuberculin testing and x-raying of positive reactors or exclusive x-raying if funds are available with special attention to contacts, should be the method of choice. To further enhance a tuberculosis survey, those in whom the x-ray demonstrated a consid-

erable amount of tuberculous infection, but no manifest tuberculosis, should be persuaded to have the adult household contacts examined, thus paving the way for the discovery of the source of the infection.

Our best single asset in the discovery of early tuberculosis is the x-ray. One can see tuberculosis in many instances when one cannot hear it. Research studies are constantly being made to lower the cost of the x-ray.

Apropos of the symptomatology associated with tuberculosis, there is no definite symptom complex. We all have a knowledge of the individual who outwardly appears to be in good health and may even be of the athletic or rugged type, but nevertheless may have tuberculosis. It does not necessarily follow that an individual who has temperature, loss of weight, cough, sputum, fatigue, or even hemorrhage, has tuberculosis. However, if any of these symptoms do manifest themselves, an examination including x-ray of the lungs is in order.

Apropos of mass surveys and the use of the tuberculin test: Old Tuberculin, Purified Protein Derivative or the Patch Test can be used. With the use of Old Tuberculin, the expense is somewhat lessened, but in any group, false reactions due to protein sensitization will be seen, and in many instances, several dilutions should be used. It is, therefore, more desirable but more expensive to use the Purified Protein Derivative (PPD) and thus avoid these false reactions. It has been my experience that the PPD is very potent and should be used with due caution. Avoid the use of the second strength whenever possible. In our surveys among high school, college, and university students, where one test is to be used, experience has taught us that one should use ten times the first strength dilution when making only one test. This dilution was found to be very satisfactory and no severe reactions resulted. O. T. (Old Tuberculin) and PPD are used via the Mantoux or intradermal method (between the layers of the skin).

During the past several years the Patch Test has been widely used. This consists of squares of tuberculin placed upon adhesive strips with a central square of control material and applied to the forearm or back (Vollmer Patch). A similar test, the Wolff Test, makes use of a pea-sized amount of

tuberculin ointment and a similar amount of control material.

It must be kept in mind that positive reactions to tuberculin often are delayed. The reading is usually made at the 48th hour. In any group some of the positive reactions will be seen at the 72nd hour or even the 96th. Therefore, if one reading is to be made, the 72nd hour should be the one of choice.

During a recent high school survey in this county, the daughter of one of the superintendents of schools reacted positively to the test. The x-ray revealed no manifest disease in the chest. Last summer this girl developed symptoms referable to the abdomen. Various diagnoses were made and finally an exploratory operation was performed. An active tuberculous appendix was found. By the same token and during the same survey a positive tuberculin test on a junior in high school was the incentive for the x-ray and discovery of advanced adult type of tuberculosis. It was known that this physician's son had been in contact, for a number of years, with a tuberculous mother. He never acquiesced to the suggestion that an x-ray be taken of the chest. Necessarily, all reactors in the high school group were x-rayed. Thus was brought to light an advanced state of adult tuberculosis. This boy is now in a sanatorium.

It is the opinion of some authorities that tuberculin testing and x-raying of positive reactors should include children. In other words, one can, in such a procedure, put the cart before the horse. If the children show a large amount of tuberculous infection, obviously the first source of infection would be the family adult household contacts. Thus the discovery of early adult type tuberculosis might be further enhanced by this type of survey. We have found in our work in this county that few individuals under 15 years have to be hospitalized for manifest pulmonary tuberculosis. Those with active primary type of tuberculosis infection, with modified sanatorium regime instituted at home, do very well. Therefore, as regards those under 15, it might be said that tuberculosis does not present a serious problem between the ages of 5 and 15. From birth to the age of 5 we might do well to check closely those who have become infected, especially when the infection shows a tendency to become manifest disease. This precaution

should be exercised, not because of the lung pathology *per se*, but because of the possible various complications such as a blood stream infection (miliary type) with complicating meningitis or peritoneal involvement with fatal termination.

In making school, college, and university tuberculosis surveys—faculty, workers, and especially food handlers, should be examined. This group may give you a better yield of tuberculosis than the student body.

Naturally, one should frown upon wholesale tuberculin testing. This procedure does not constitute an adequate case-finding program. We should direct our efforts, when using this test, to groups from which a fruitful yield of tuberculosis is to be expected. The testing should be augmented by x-ray examinations of positive reactors, the x-raying of those who are contacts and refused the test, and an adequate follow-up program.

In making early surveys using the tuberculin test, namely among nurses, medical students, and hospital workers, if the test is negative one year, and positive the following year, it is of extreme clinical significance.

In paving the road to early diagnosis, the essential stepping stones are forthwith summarized:

1) The organization of all official and unofficial agencies in one's respective locality.

2) The institution of surveys to include those groups from which we can expect the most fruitful yield of tuberculosis.

3) Do not neglect the 1 to 5 years group if tuberculosis exists in the household.

4) Concentrate on the 18 to 35 age group, but do not neglect the 40 to 60 group.

5) The hospitalization of all active cases.

6) The examination of adult household contacts.

7) Increased traveling clinics.

8) The examination and x-ray of individuals who are apparently ill but cause is uncertain.

9) Chest x-rays for all life insurance applicants.

10) The x-ray of all pre-natals.

11) The education of the family physician to the importance of early x-ray.

12) The x-ray of the chest of all applicants for employment with special attention to dusty industries and routine periodic x-ray thereafter.

13) Routine x-rays of chest of patients admitted to general and mental hospitals. Also, routine periodic x-ray of all employees in these hospitals.

14) The continuous concentrated efforts of all health agencies.

St. Johns Hospital.

Organization News

REPORT OF COMMITTEE ON MILITARY AFFAIRS

Shortly after the declaration of war upon the axis nations by Great Britain, the American College of Chest Physicians, meeting in annual session at New York City, appointed a Committee on Military Affairs to coordinate the efforts of the chest specialists in this country and to render whatever service they could as an organized body to the Surgeons General of the Army and the Navy, and to the country as a whole. The committee was organized in June, 1940, with Dr. Chas. M. Hendricks, El Paso, Texas, as chairman. The other members of the committee were: Drs. Hugh A. Kinghorn, Saranac Lake, New York; Ralph C. Matson, Portland, Oregon; Edgar Mayer, New York City; J. Winthrop Peabody, Washington, D. C.; Joseph W. Post, Philadelphia, Pa.; and Walter E. Vest, Huntington, West Virginia.

The activities of this committee were reported

at the Cleveland meeting of the College in June, 1941; and the complete report was published in the October, 1941, issue of the Journal. (Vol. VII, No. 10:1941.)

Dr. Hendricks was reappointed as the Chairman of this committee following the Cleveland meeting and the following new members were added: Brigadier General S. U. Marietta and Commander Robert E. Duncan, Washington, D. C.; Drs. Joseph C. Placak, Cleveland, Ohio; and Arnold Shamaskin, Albuquerque, New Mexico.

The committee has been cooperating with the Subcommittee on Tuberculosis of the Committee on Medicine of the National Research Council; with the Surgeons General of the Army and Navy; and with the Committee on Medical Preparedness of the American Medical Association. The letter reproduced on the editorial page of this issue of the Journal acknowledges the work accomplished in connection with the Committee on Medical Preparedness of the American Medi-

cal Association.

The information concerning the qualifications of Tuberculosis Specialists furnished by the College to the Committee on Medical Preparedness of the American Medical Association is being turned over to the Procurement and Assignment Service which has been set up recently at Washington under the direction of Major S. F. Seeley, M.C., U. S. Army. This information will be attached to the data which the physicians are being asked to supply on a new questionnaire to be released shortly by the Procurement and Assignment Service.

This new questionnaire is not to be confused with previous questionnaires filled in by physicians. The purpose of this new questionnaire will be to ascertain the place where each physician in the United States can best serve his country in the war effort. It is important that every member of the College complete the questionnaire and return same promptly. If you do not receive a copy of the questionnaire, write to the Procurement and Assignment Service, 601 Pennsylvania Avenue, Washington, D. C., for a copy.

The Committee on Military Affairs of the College will continue to cooperate with all of the agencies previously established to aid in the war effort and with the Procurement and Assignment Service recently established.

NEW YORK STATE CHAPTER TO MEET

The New York State Chapter of the American College of Chest Physicians will hold its annual meeting in conjunction with the meeting of the New York State Medical Society at the Waldorf Astoria Hotel, New York City, on Thursday afternoon, April 30th.

A symposium on diseases of the chest sponsored by the New York State Chapter of the College will be held before the General Assembly. The following speakers will take part in the program:

Dr. Edgar Mayer, New York City, who has been chosen as the recipient of the A. Walter Sulter Lectureship of the Medical Society of New York. This Lectureship is awarded to the outstanding speaker of the General Sessions. The New York State Chapter is justly proud to have one of its members and former President be selected as the outstanding speaker of the meeting. Dr. Mayer's presentation will be, "New Aspects of Pulmonary Tuberculosis and Their Significance in Medical Practice."

Dr. Eugene P. Pendergrass, professor of Roentgenology, University of Pennsylvania Medical School and Director Department of Radiology, University of Pennsylvania Hospital, Philadelphia, Pa., will present a paper on "The Role of the Radiologist in the Diagnosis of Lesions Involving the Respiratory Tract."

Dr. Richard Overholt, Boston, Mass., formerly Director Department on Thoracic Surgery, Lahey Clinic, will present a paper on, "Cancer of the

Lung."

Dr. Arthur Q. Penta, Visiting Lecturer in the Department of Medicine, Temple University Medical School, Philadelphia, Pa., and Director of the Bronchoscopic Clinic of the Schenectady City Hospital, will present a paper on, "The Role of the Bronchoscopist in the Diagnosis and Treatment of Diseases Involving the Bronchial Pulmonary Tract."

The above mentioned papers will be given before the General Assembly on the afternoon of Thursday, April 30, 1942, Waldorf Astoria Hotel, New York City. The officers of the New York State Chapter sincerely hope that every member of the State Chapter will be in attendance.

*Arthur Q. Penta, Secretary
New York State Chapter of the
American College of Chest Physicians*

OHIO STATE CHAPTER TO MEET

The Ohio State Chapter of the American College of Chest Physicians will hold its annual meeting at the Neil House, Columbus, Ohio, Wednesday, April 29. A luncheon will precede the meeting, which is to be addressed by a speaker of note. Election of officers for the coming year will be held. The Ohio Chapter of the College meets jointly with the Ohio State Medical Society.

PROGRAM OF THE TEXAS CHAPTER AMERICAN COLLEGE OF CHEST PHYSICIANS

To Be Held
MAY 11, 1942

During the Texas Medical Society Meeting
Rice Hotel at Houston, Texas.

Dr. C. M. Hendricks, El Paso, Texas, President;
Dr. J. B. McKnight, Sanatorium, Texas, Vice
President; Dr. C. J. Koerth, San Antonio, Texas,
Secretary-Treasurer.

Afternoon Session—May 11, 1942.

Time: 1:30 P. M. Room: French Room, Rice Hotel.

1) Paper titled "Tuberculosis Tracheobronchitis," Dr. David McCullough, Sanatorium, Texas. Discussion opened by Dr. Henry Hoskins, San Antonio, Texas.

2) Paper titled "Fungus Disease of the Lung," Dr. Alvis Greer, Houston, Texas, and Dr. Henry N. Gemoets, Houston, Texas. Discussion opened by Dr. Sam Thompson, Kerrville, Texas.

3) Symposium on Surgical Treatment of Tuberculosis:

a) Paper titled "Post-Thoracoplasty Care, Scoliosis, Pain and Rehabilitation," Dr. Robert Shaw, Dallas, Texas.

b) Paper titled "Thoracoplasty," Dr. E. W. Coyle, San Antonio, Texas.

c) Paper titled "Interpleural Pneumonolysis," Dr. J. Emerson Dailey, Corpus Christi, Texas.

Discussion on symposium to be opened by Dr. Felix Miller, of El Paso, Texas.

4) Paper titled "Unusual Tumor of the Tongue," Dr. R. G. McCorkle, San Antonio, Texas.

Discussion opened by Dr. A. O. Severance, San Antonio, Texas.

Open to all physicians who are interested in Chest Diseases.

Evening Session

May 11, Business Meeting and Election of Officers; Time, 6:00 P. M., French Room, Rice Hotel.

Dinner will be served at evening session.

Guest speaker, Dr. Ralph C. Matson, Portland, Oregon, will present a paper titled "Thoracoplasty in Diagnosis of Intrathoracic Tumors."

Entertainment Committee

"Dr. Alvis E. Greer, Chairman; Dr. H. Caplovitz; Dr. Henry N. Gemoets; Dr. T. R. Jones; Dr. F. Hartman Kilgore; Dr. Shaw McDaniel; Dr. John R. Phillips; Dr. George Waldron, Houston, Texas.

INDIANA CHAPTER MEETS

The Indiana Chapter of the American College of Chest Physicians held its midwinter meeting at Columbia Club, Indianapolis, on March 22, 1942, at 2:00 P. M.

The following program was presented:

1) Dr. John V. Thompson, Indianapolis, Ind., "Monaldi Procedure With Three Cases."

2) Dr. Paul Crimm, Evansville, Ind., "Parafine Apicolysis."

3) Dr. M. H. Draper, Fort Wayne, Ind., "Allergic Lung Conditions."

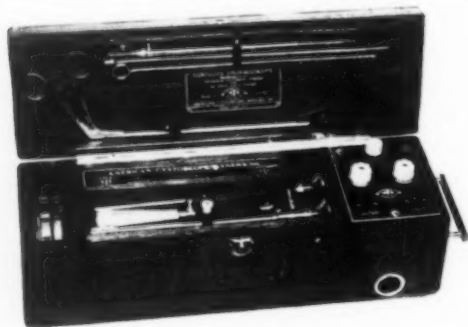
4) Dr. J. V. Pace, New Albany, Ind., "Diagnosis by Lipiodol."

5) Dr. P. H. Becker, Crown Point, Ind., "Silico Tuberculosis."

6) Dr. H. B. Pirkle, Rockville, Ind., "Several Diagnostic Problems."

7) Dr. J. H. Stygall, Indianapolis, Ind., X-Ray Conference.

The meeting was well attended by the Fellows of the College in Indiana and a number of guests were present which included Dr. Paul A. Turner, Louisville, Governor of the College for Kentucky; Dr. Otto C. Schlack, Oak Forest, Illinois, President of the Illinois Chapter of the College; Dr. John A. Proffitt, Louisville, Kentucky; Thomas A. Hendricks, Secretary of the Indiana State Medical Society; and Murray Kornfeld, Chicago, Executive Secretary of the College. Dr. James H. Stygall, Indianapolis, Governor of the College for Indiana, presided at the business session and Dr. Merlin H. Draper of Fort Wayne, President of the Indiana Chapter, presided at the scientific program. The next meeting of the Chapter will be held in connection with the annual meeting of the Indiana State Medical Society.



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